COMMUNICATION METHOD AND SYSTEM

FIELD OF THE INVENTION

[0001] This invention relates to communications systems and has particular but not exclusive application to local areas (e.g. autonomous) cellular communications systems.

BACKGROUND TO THE INVENTION

[0002] A proposal for LTE-A (Long Term Evolution Advanced) radio systems is autonomous component carrier selection. In such systems, an arrangement of base stations in a communication system such as a cellular communication system, also referred alternatively as Node B's, operate generally without central control. Conventional systems generally include a network controller for example.

[0003] This enables cheap uncoordinated deployment of Node Bs in local area environments. More details for this can be found in on-line documents R1-083733 and R1-083103 at http://www.3gpp.org.

[0004] An autonomous component carrier selection scheme has been proposed which relies on a concept where each cell automatically selects one of the component carriers as its primary carrier (also some-times called the base carrier). The primary/base carrier is assumed to be used for initial connection of User Equipment e.g. terminals in the cell. Depending on the offered traffic in a cell and the mutual interference coupling with the surrounding cells, transmission/reception on all component carriers may not always be the best solution. It is therefore proposed that each cell dynamically selects additional component carriers for transmission/reception as well. The latter is referred to as selection of secondary component carriers (also some-times called extended carriers). All component carriers not selected for primary or secondary are completely muted (uplink/downlink) and not used by the cell. In order to have efficient autonomous component carrier selection at each Node B (also referred to alternatively as a base station or an eNB in 3GPP terminology, some information from the neighbouring Node Bs is also needed by an Node B, and this information is assumed to be available via inter Node B over-the-air communication (OTAC) for cases where there is no X2 between the Node Bs (i.e., meaning Home/Femto Node B cases). X2 is a common interface between eNodeB's. One of the major challenges for inter Node B OTAC is how to coordinate such transmissions/receptions among the Node Bs, which are within the same local area cluster. The latter is assumed to be the case for both FDD and TDD. However, a Node B may be able to receive multiple OTAC messages from different Node Bs at the same time if these are sent on different component carriers. If the OTAC messages use a cell-specific scrambling/spreading component, it might even be possible to receive multiple OTAC messages within the same component carrier at the same time. There is a requirement to provide an accurate method for coordinating the transmission and reception of OTAC messages. The invention provides for Node Bs to send OTAC messages. The invention also provides rules for when Node Bs have to be in Discontinuous reception (DTX) for reception of potential OTAC messages by other Node Bs in the close vicinity.

STATEMENT OF THE INVENTION

[0005] According to a first aspect of the invention there is provided a method of co-ordinating communication between a plurality of base stations in a communication system, comprising designating and or synchronising timeslots where said base stations receive and/or transit information to each other.

[0006] The information may pertain to co-ordination of said base stations. The information may be OTAC messages.

[0007] The base station may be part of a cellular communication network, such as an autonomous network.

[0008] Preferably the timeslots are regularly spaced.

[0009] In a preferred embodiment the timeslots are a function of system frame number (SFN).

[0010] In an alternative preferred embodiment the timeslots may be based on monitoring and adopting the patterns of neighboring base stations.

[0011] In an embodiment, the method includes determining if the base station has a message to transmit, and if not it listening to potential messages coming from other base stations.

[0012] Another embodiment includes determining if a base station has a co-ordination message to be transmitted, and if so transmitting the information in the first coming timeslot.

[0013] The information may be retransmitted automatically. In another preferred embodiment, the information may be retransmitted after N timeslots periods. N may be a (pseudo) random integer. In one embodiment N may be different from and varies between different base stations. N may be based on base station ID.

[0014] According to a second aspect of the invention there is provided a computer readable medium comprising a computer program thereon, said computer program performing the methods of the invention.

[0015] According to a third aspect of the invention a base station adapted to receive and/or transit information to or from one or more other base stations during designating and/or synchronised time slots.

[0016] The information may pertain to co-ordination of a plurality of base stations in a communication system, such as an autonomous cellular communication system.

[0017] According to a fourth aspect of the invention there is provided a communication system comprising a plurality of base stations, said base stations adapted to receive and/or transit information to or from one or more other base stations during designating and/or synchronised timeslots.

SUMMARY OF FIGURES

[0018] For a better understanding of the present invention and how the same may be carried into effect, reference will now be made by way of example only and to the accompanying drawings in which:

[0019] FIG. **1** shows schematically a conventional LTE system.

[0020] FIG. **2** shows elements the system of FIG. **1** in more detail.

[0021] FIG. **3** Simple illustration of a local area autonomous system with five eNode Bs having OTAC wherein an embodiment of the invention may be utilised.

[0022] FIG. **4** shows an example of component carriers forming which may be utilised with the FIG. **3** system.

[0023] FIG. **5** shows an illustration of one embodiment of the invention where regular periodic time pattern where Node Bs listens for or sends OTAC messages.